

REMARKS/ARGUMENTS

Claims 33-46 are pending. By this Amendment, the specification has been amended and new claims 33-46 are presented in favor of the prior presented claims in the application, which are now canceled. Reconsideration in view of the above amendments and the following remarks is respectfully requested.

Claims 26 and 28 were rejected under 35 U.S.C. §102(b) over Kinsley (U.S. Patent No. 3,026,991) or Schneider (U.S. Patent No. 4,566,583). These rejections are respectfully traversed.

Independent claim 26 is replaced herein by new independent claim 41 which recites a method comprising conveying loose grapes along a conveying direction by using a screw feeder, wherein said screw feeder has a pitch increasing along said conveying direction.

Neither Kinsley nor Schneider teaches or discloses this subject matter.

Kinsley discloses a feed screw for conveying bottles 22 comprising a drive shaft 36, and a flute 52 extending along the shaft and defining root portions 30 on the shaft 36. The flute 52 gradually enlarges into a fairly wide flute 54. Since the flute 52 gradually enlarges in the conveying direction, the bottles 22 become gradually spaced. Moreover, the feed screw according to Kinsley conveys discrete items, i.e., bottles 22, and not loose grapes, as recited in claim 41.

Schneider describes a worm conveyor 6 for conveying and spacing bottles 4, comprising a worm body 9 made of wear resistant plastic material and provided with a thread 10 of increasing lead so that the spacing between two adjacent bottles 4 may be increased.

Schneider does not disclose conveying loose grapes, per claim 41. Discrete bottles are conveyed by the screw feeder according to Schneider.

None of the applied references discloses a method comprising conveying loose grapes. This is a positively claimed aspect of the method that cannot be ignored. Furthermore, the cited references do not suggest that a screw-feeder having a pitch increasing along the conveying direction can be used to convey loose grapes.

The applied references only disclose conveying of stress-resistant objects, such as bottles. Loose grapes are delicate objects which can be easily damaged, thereby causing premature juice extraction which jeopardizes the quality of the wine obtained from the grapes. The skilled person would believe that a screw-feeder used for conveying bottles cannot be used for processing grapes, because the grapes cannot withstand the high stresses applied to bottles, as disclosed in Kinsley or Schneider.

Applicant has found that, by conveying loose grapes by using a screw-feeder having a pitch increasing along the conveying direction, it is possible to avoid substantial damage to the grapes.

Reconsideration and withdrawal of the rejection are respectfully requested.

Claims 17, 19-26 and 28-32 were rejected under 35 U.S.C. §103(a) over British Patent Application No. 2,189,205 in view of Schneider in view of Kinsley. This rejection is respectfully traversed.

Newly filed claim 33 is based on claim 17 previously presented.

Neither British Patent Application, Schneider nor Kinsley teaches or suggests this subject matter.

According to new claim 33, there is provided an apparatus for conveying a bulk quantity of a loose product selected from fruit or vegetable, the apparatus comprising a hopper device extending substantially along a screw-feeder arrangement which conveys the product to an outlet

zone. The screw-feeder arrangement is provided with a shaft and a helical surface protruding from said shaft and having a variable pitch so as to define around the shaft conveying spaces into which the product to be conveyed is housed. The helical surface is so shaped that the conveying spaces defined around the shaft widen towards the outlet zone and may receive increasing quantities of the product to be conveyed.

Owing to the widening conveying spaces, the apparatus according to new claim 33 allows the fruit or vegetable loose product to be gently conveyed and the squeezing thereof to be greatly reduced.

The loose product is fed to the screw-feeder arrangement from the hopper device, which extends substantially along the screw-feeder arrangement. As the shaft rotates, the helical surface pushes the loose product received in the conveying spaces towards the outlet zone. However, fruit and vegetable products often have an irregular shape and comprise protruding portions, such as stalks, stems or leaves. These protruding portions may be entangled with the protruding portions of the adjacent products, so that products contained in a conveying space drag towards the outlet zone overlying products still contained in the hopper device.

By providing conveying spaces widening towards the outlet zone, increasing quantities of loose product may be received by the conveying spaces, e.g., the conveying spaces close to the outlet zone may receive a quantity of product greater than the conveying spaces far from the outlet zone. Therefore, the fruit and/or vegetable product lying in the hopper device and dragged by the underlying products with which they are entangled may be progressively housed in the widening conveying spaces.

It is, thus, possible to avoid accumulation of the fruit and/or vegetable products at the outlet zone of the hopper device and high pressures generated in the conveying spaces.

Furthermore, damages both to the product in the hopper device and to the product in the conveying spaces due to the reciprocal dragging and drawing are substantially avoided.

In addition, the product is not excessively squeezed during conveying and juice is not prematurely extracted.

These advantages are clearly disclosed in the application as originally filed (see paragraphs [0020], [0021] and [0038] of the U.S. publication.

British Application No. 2,189,205 describes a conveying screw 1 comprising a conveying tube 2 within which is rotatably mounted a flight 4 carried by a shaft 6, both the flight 4 and the shaft 6 being of constant diameter. The conveying screw 1 further comprises an opening 8 through which the conveying screw 1 may be fed to a hood 14 provided above the opening 8, fixed to the conveying tube 2 by means of brackets 16. The hood 14 can be moved in respect to the conveying tube 2 so as to allow variable loading to be applied to the conveying screw 1.

British Application No. 2,189,205 does not disclose a screw-feeder arrangement provided with conveying spaces widening along the shaft and/or conveying screw and a helical surface having a variable pitch. As clearly shown in Figure 1, the conveying screw according to British Application No. 2,189,205 has a constant pitch.

Therefore the conveying spaces defined on the shaft 6 of the conveying screw according to British Application No. 2,189,205 cannot receive increasing quantities of a product to be conveyed. The Examiner acknowledges this deficiency, but attempts to make up for it based on the teachings of Kinsley/Schneider. However, the screw feeder disclosed in Kinsley is used to space bottles upstream of a filling station, so that the bottles fed to the filling station are separated by a pitch which is greater than the pitch of the bottles before reaching the screw feeder. In order to space the bottles, the screw feeder disclosed in Kingsley has a thread

extending along its length composed of a gradually increasing thread 52 which enlarges into a fairly wide thread 54. Between corresponding points of the thread 52, root portions 30, i.e., conveying spaces, are defined having a constant width, as clearly shown in Figure 1. The width of each conveying space corresponds to the dimension of the conveyed bottles 22, so that each bottle 22 is housed precisely in a conveying space. If the width of the conveying spaces disclosed in Kinsley increased, each bottle would move inside the corresponding conveying space because of the clearance between the bottle and the walls of the conveying space. Precise feeding of the bottles to the filling station would therefore be impossible.

From the above, it is clear that the apparatus according to claim 33 is not obvious over British Application No. 2,189,205 in view of Kinsley since neither discloses either explicitly or implicitly conveying spaces widening along the shaft, so as to receive increasing quantities of the product to be conveyed. On the contrary, Kinsley leads away from claim 33, because the screw feeder disclosed in Kinsley could not work properly if the conveying spaces were widened along the shaft.

If a screw feeder of the kind disclosed in Kinsley were used to convey a bulk quantity of product selected from fruit or vegetable, the above discussed drawbacks such as product accumulation at the outlet zone would occur. Consequently, the fruit or vegetable product would be damaged.

It is further observed that Kinsley does not disclose a hopper device having a lower zone through which the product is delivered to the screw-feeder arrangement. The Examiner is of the opinion that the provision of a hopper device is obvious in view of the combination of Kinsley and British Application No. 2,189,205. However, the conveying spaces having a width widening towards the outlet zone so as to receive increasing quantities of the conveyed product are not

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suggested by the combination of Kinsley and British Application No. 2,189,205. In fact, the screw feeder disclosed in British Application No. 2,189,205 has a constant pitch and consequently the width of the conveying spaces does not vary along the shaft.

Similar considerations are applicable to Schneider, and to the combination of Schneider and British Application No. 2,189,205.

In fact, Schneider also discloses a conveyor having a thread whose width widens towards the outer zone, in order to space the conveyed bottles. Nevertheless, the width of the conveying spaces in which a product may be housed remains constant. Thus, also the conveyor according to Schneider cannot receive increasing quantities of the product to be conveyed.

Reconsideration and withdrawal of the rejection are respectfully requested.


In view of the above amendments and remarks, Applicants respectfully submit that all the claims are patentable and that the entire application is in condition for allowance.

Should the Examiner believe that anything further is desirable to place the application in better condition for allowance, he is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

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